Environmental *Change* Institute

UNIVERSITY OF OXFORD

Domestic energy retrofit

Homeowner motivation, knowledge and involvement

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Research on retrofit in ECI

Projects:

CREDS

RETROFIT FOR THE FUTURE

Building expertise

Energy Superhub Oxford

LEO Local Energy Oxfordshire

Associated people:

Tina Fawcett

Marina Topouzi

Gavin Killip

Homeowner retrofit journeys

Focus on homeowner journeys:

- Net-zero targets
- Energy use at home is 1/3 of the total UK energy use
- 70% of the housing stock is owner-occupied

Broader picture:

- Builders' skills
- Challenges in the supply chain
- Financing mechanisms
- …

Understanding retrofit journeys

Existing approach:

– Focus on the identification of **drivers** and **barriers** to retrofit, to strengthen the former and reduce the latter.

– Focus on **cognitive** reasoning to promote benefits of low-carbon dwellings

Alternative approach:

– Focus on the **temporal sequence** of various influences, to understand and facilitate the movement through stages of retrofit journeys.

– Incorporate **emotional** aspects associated with the benefits of low-carbon living in relation to ones home.

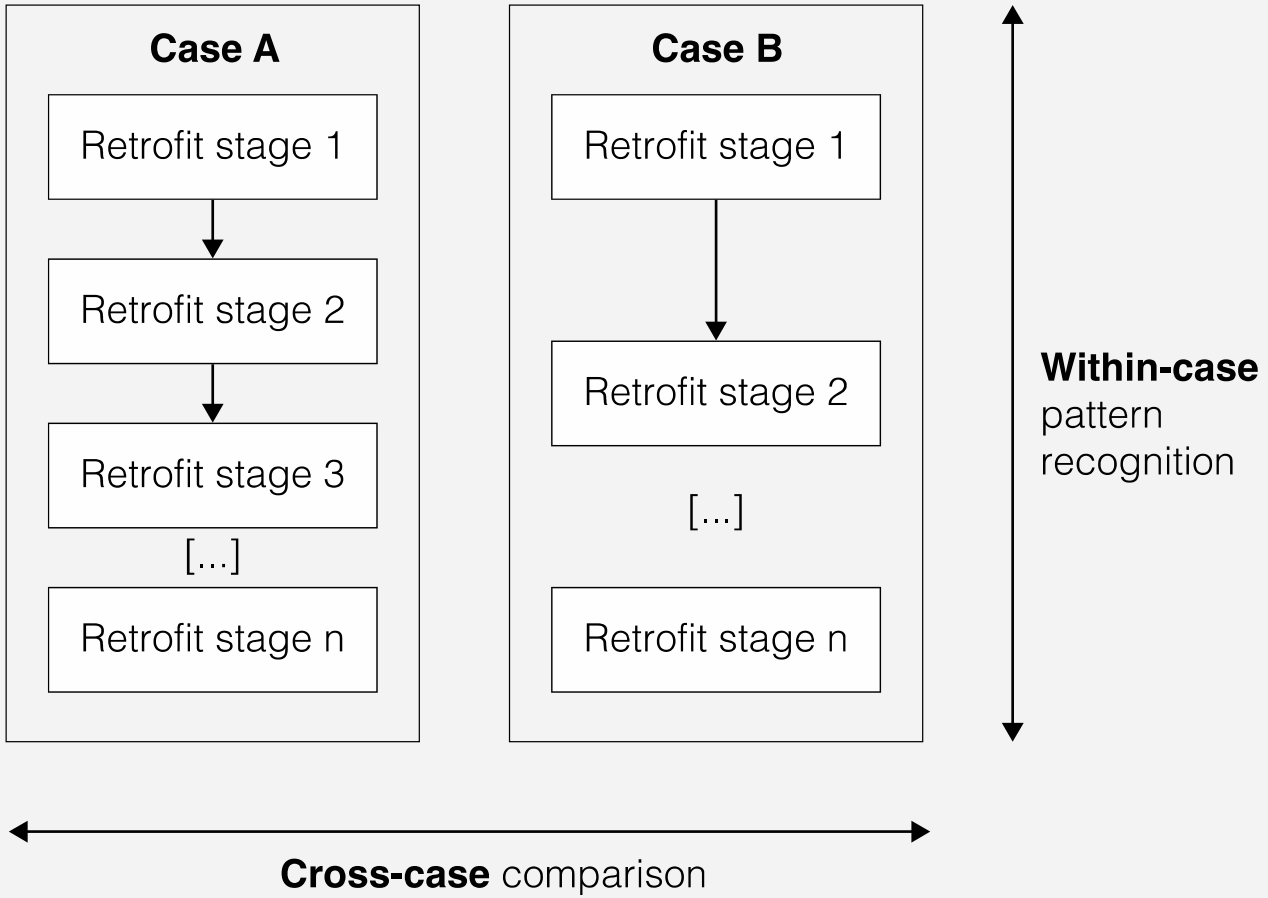
Data collection: case studies

Primary data:

- 8 cases: SuperHomes owners, at least 60% relative carbon reductions
- 10 interviews: homeowners, retrofit of different depth, expertise in energy retrofit.
- 10 interviews: homeowners, retrofit of different depth, no expertise in energy retrofit.

Secondary data:

- 18 cases: homeowners, retrofit of different depth



Work dissemination

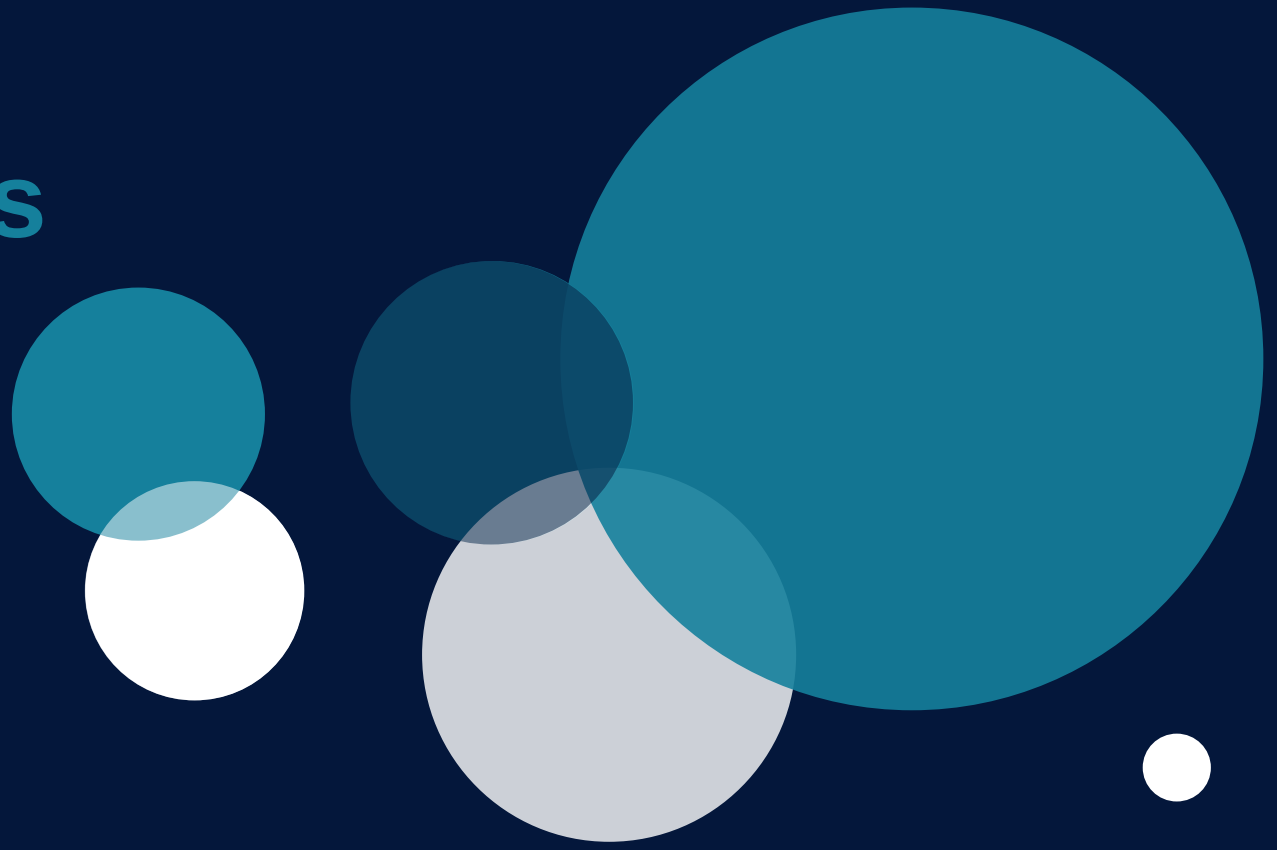
- Bobrova, Y., Papachristos, G. (2022) ‘Home meanings as a framework to analyse and promote the diverse benefits of low-carbon dwellings’. In: *ECEEE Summer Study*. 6–11 June 2022, Hyezes, France.
- Bobrova, Y., Papachristos, G. and Cooper, A. (2022) Process perspective on homeowner energy retrofits: a qualitative metasynthesis. *Energy Policy ‘Behavioral insights for sustainable energy use: Theories, evidence and policy implications’*: 160, p. 112669.
- Bobrova, Y., Papachristos, G. and Chiu, L.F. (2021) Homeowner low-carbon retrofits: implications for future UK policy. *Energy Policy*: 155, p. 112344.

Areas

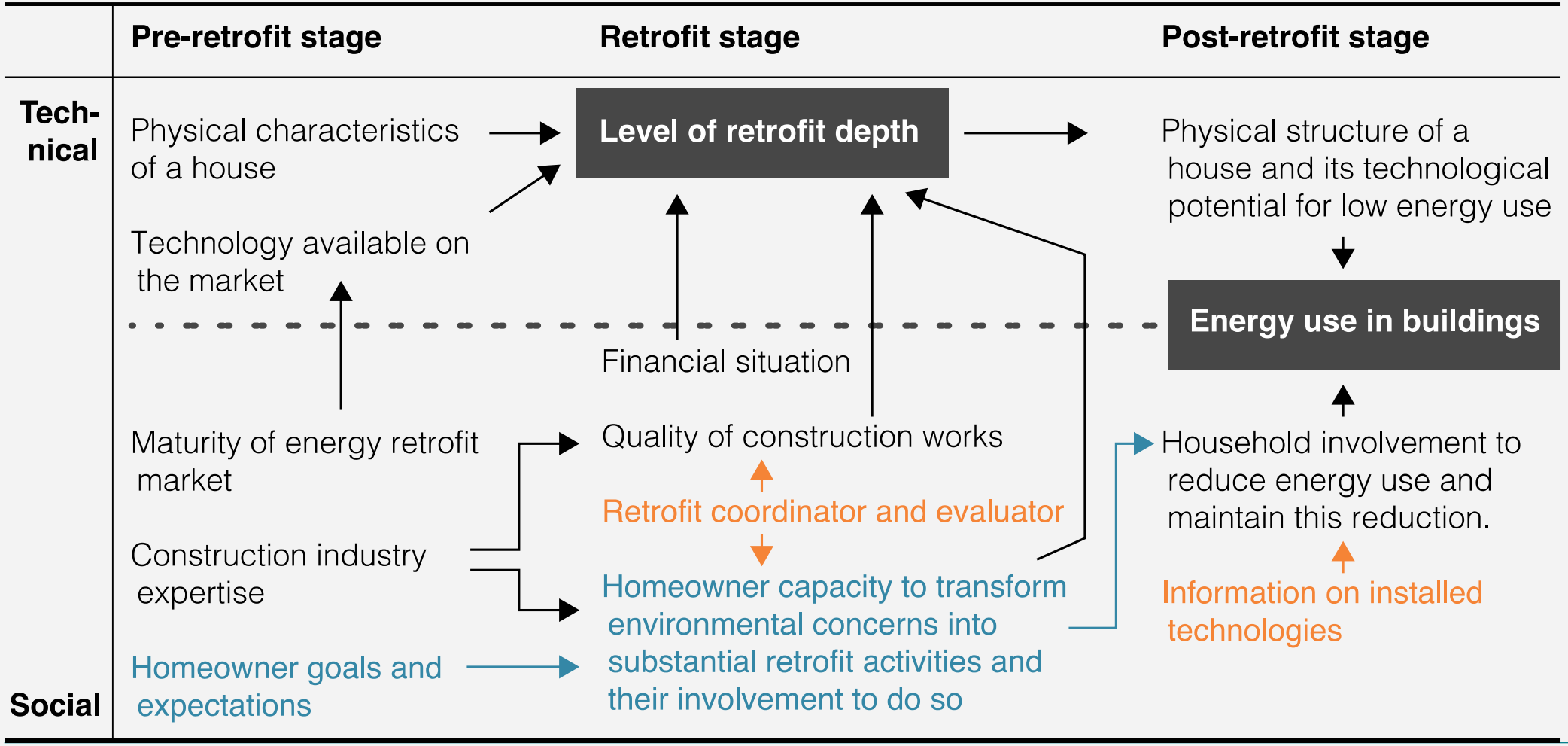
- Retrofit as a process
- Information sources
- Homeowner capacity for retrofit
- Home-meanings

Retrofit as a process

Lengthy time period over which renovation decisions unfold and strengthen



Process perspective on retrofit



Insights: retrofit as a process

Generic:

– Temporal dimension of influences: **proximal** (close in time) and **ultimate** (further removed in time)

– Both are important, ultimate influence shape a **context** within which proximate influence can make a difference

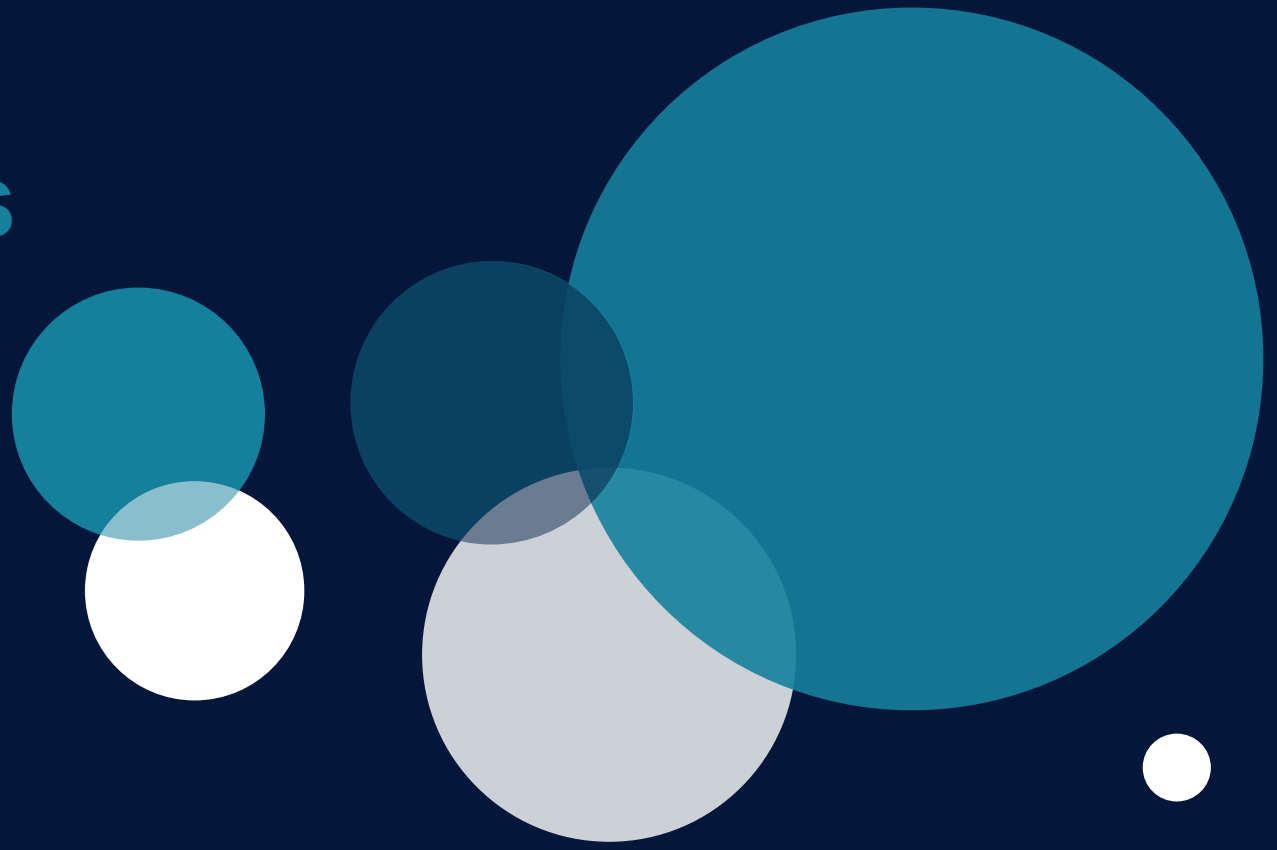
Specific:

– Reduction in energy use post-retrofit:
  - Proximate – provide information
  - Ultimate – build homeowner **capacity**

– Level of retrofit depth:
  - Proximate – retrofit coordinator
  - Ultimate – shape socio-technical realties prior to retrofit, incl. homeowner **motivations**

Information sources

Diversity of information sources at different retrofit stages for different aspects of low-carbon technology



Low-carbon home technology

Three nested levels**:**

– ***Product***

– ***Design option***, which is a solution to a particular design problem, e.g. internal and an external wall insulation represent.

– ***Technological system*** of various design options, which is more effective to optimise its efficiency as a whole, rather than each design option separately, e.g. Passivhaus.

Information sources: stages

	Pre-retrofit stage	Retrofit stage				Post-retrofit stage
		i. Option identification	ii. Option formalisation	iii. Installation	iv. Commissioning	v. Post-commissioning
Product						
Design option		**Knowledge**		**Persuasion**		
Techno-logical system						

Information sources: typology

		Type of information	
		General	**Context/ product specific**
Information sources	**Expert**	Intermediaries (Passivhaus institute, UK Green Building Council), specialist newsletters and literature, trade fairs, conferences, training courses.	Context specific: building surveyor, environmental consultant, building construction team. Product specific: manufacturer' return on investment quotes, quotes and specifications for various options.
	Non-expert	Internet, stories in nonspecialist newspapers and magazines.	Friends, neighbours, local community, Open home events at low-carbon home networks (e.g., SuperHomes.)

Insights: information sources

Generic:

– Provide information through appropriate channels at different **stages** of the **retrofit** journey for different **levels** of low-carbon technology: **product, design option** and **technological system**

– Support both **expert** and **non-expert** information sources, as they serve different functions in the process: **knowledge provision** and **persuasion**

Specific:

– Encourage local authorities to proactively deliver information on technological systems

– Support non-commercial channels and networks, such as OpenHouse events.

Energy Saving Homes Oxford

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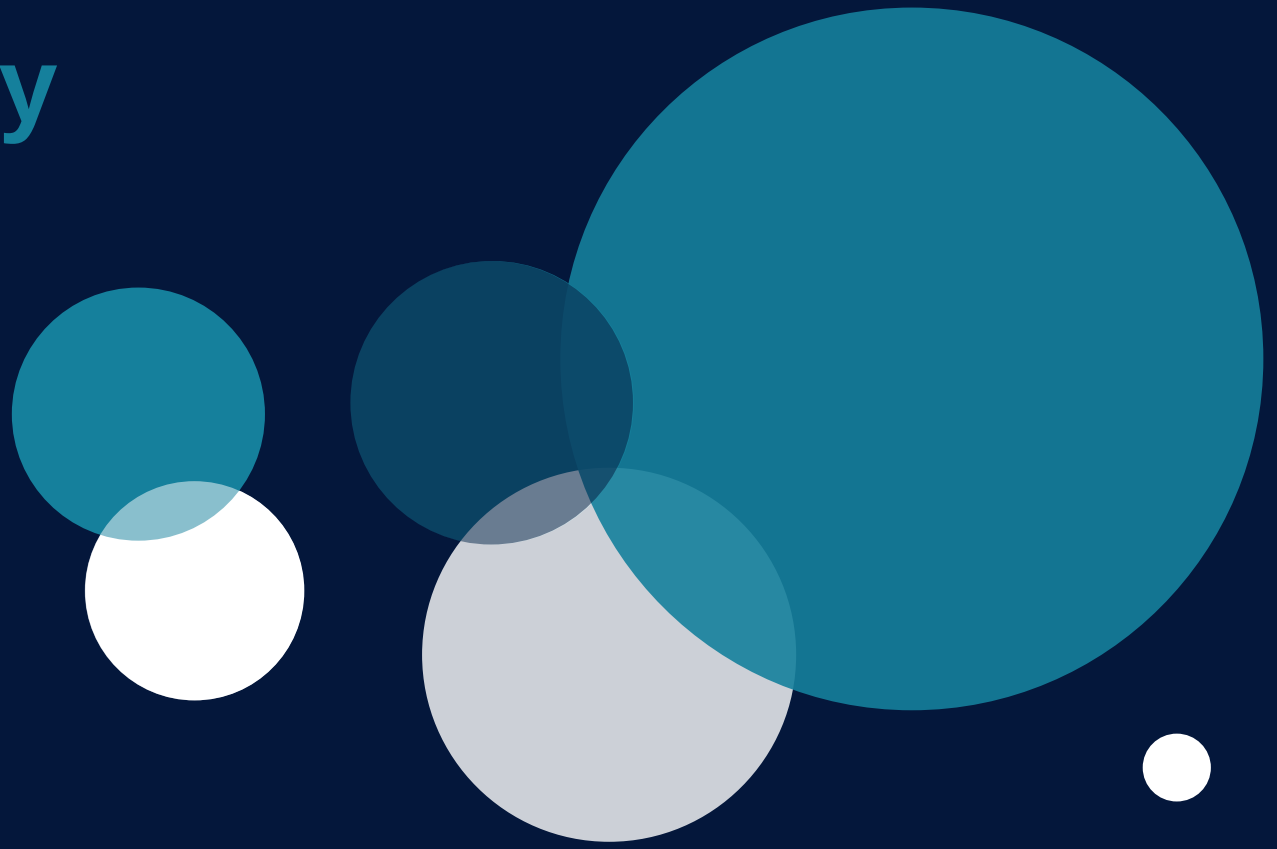
See money saving ideas in action

Homeowner capacity for retrofit

Building capacity to shape retrofit intentions, transform them into successful retrofit solutions and reduce energy use post-retrofit



Developing retrofit capacity

Processes contributing to capacity development

- Building confidence that the chosen solutions are the right ones and are installed correctly
- Maintaining the balance between the retrofit experience and the dynamics of everyday life

Manifestations of a successful capacity development

- Homeowner knowledge regarding the installed technology
- Homeowner sense of satisfaction and pride with retrofit outcomes

Implications of a successful capacity development

- Successful retrofit project
- Homeowner knowledge on how to operate their homes in an optimal, low-carbon manner
- A capacity to overlook suboptimal outcomes
- Household involvement to reduce energy use post-retrofit and maintain this reduction
- A positive word of mouth regarding low-carbon retrofit process and its outcomes

Insights: capacity building

Generic:

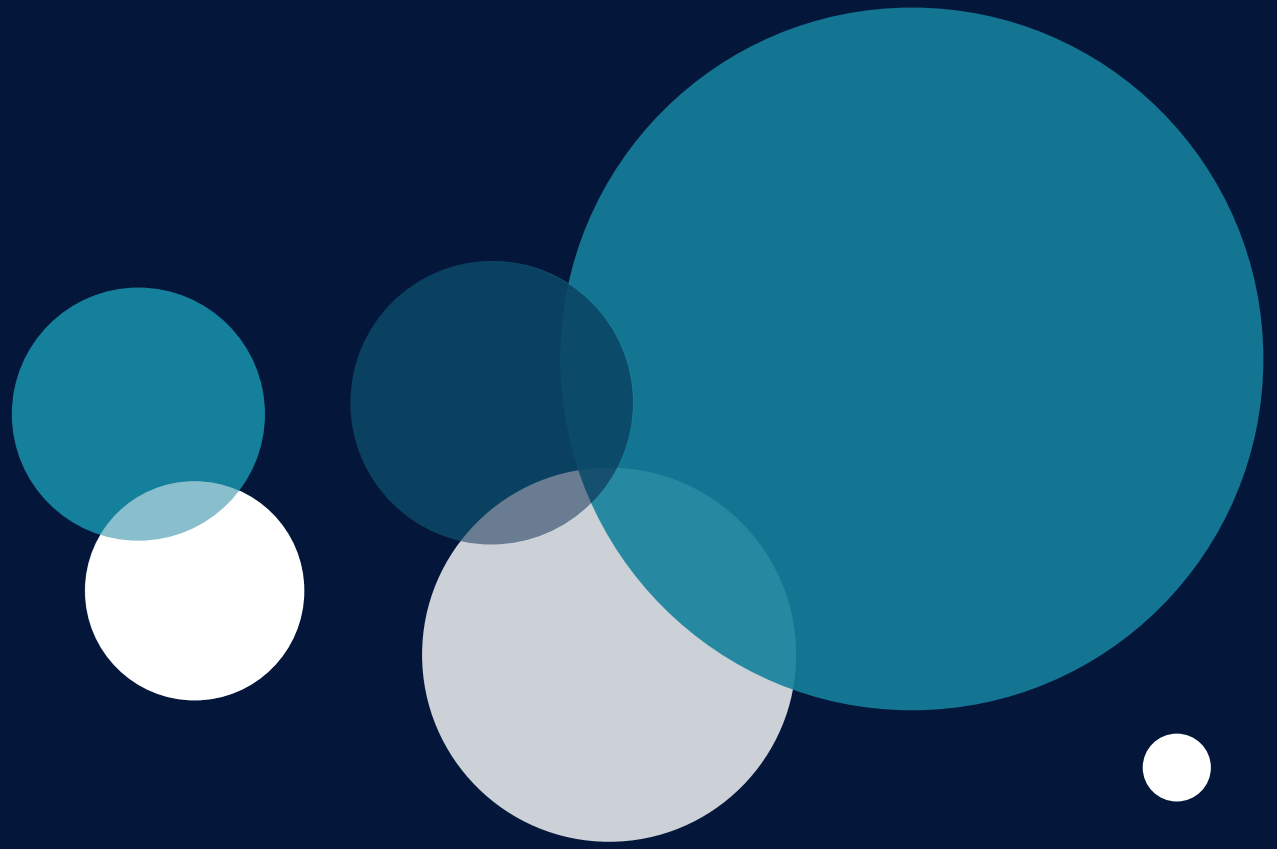
- Allow **time** to build capacity (form positive retrofit experience and build confidence in retrofit solutions)
- Support mechanisms to build trust in the chosen solutions and its outcomes

Specific:

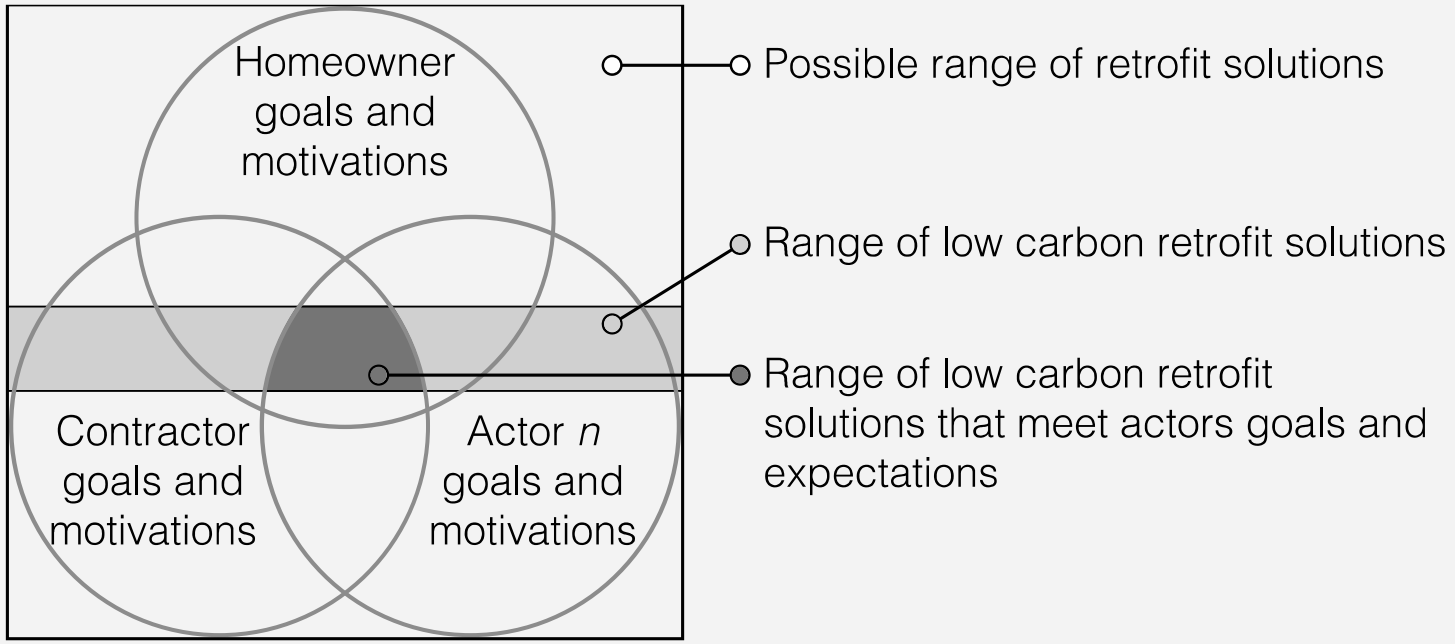
- Support step-by-step retrofit approach
- DIY retrofit ?

Home-meanings

Recognise and promote the diverse benefits of low-carbon dwellings within the meaningful realm of one's home



Actor retrofit goals



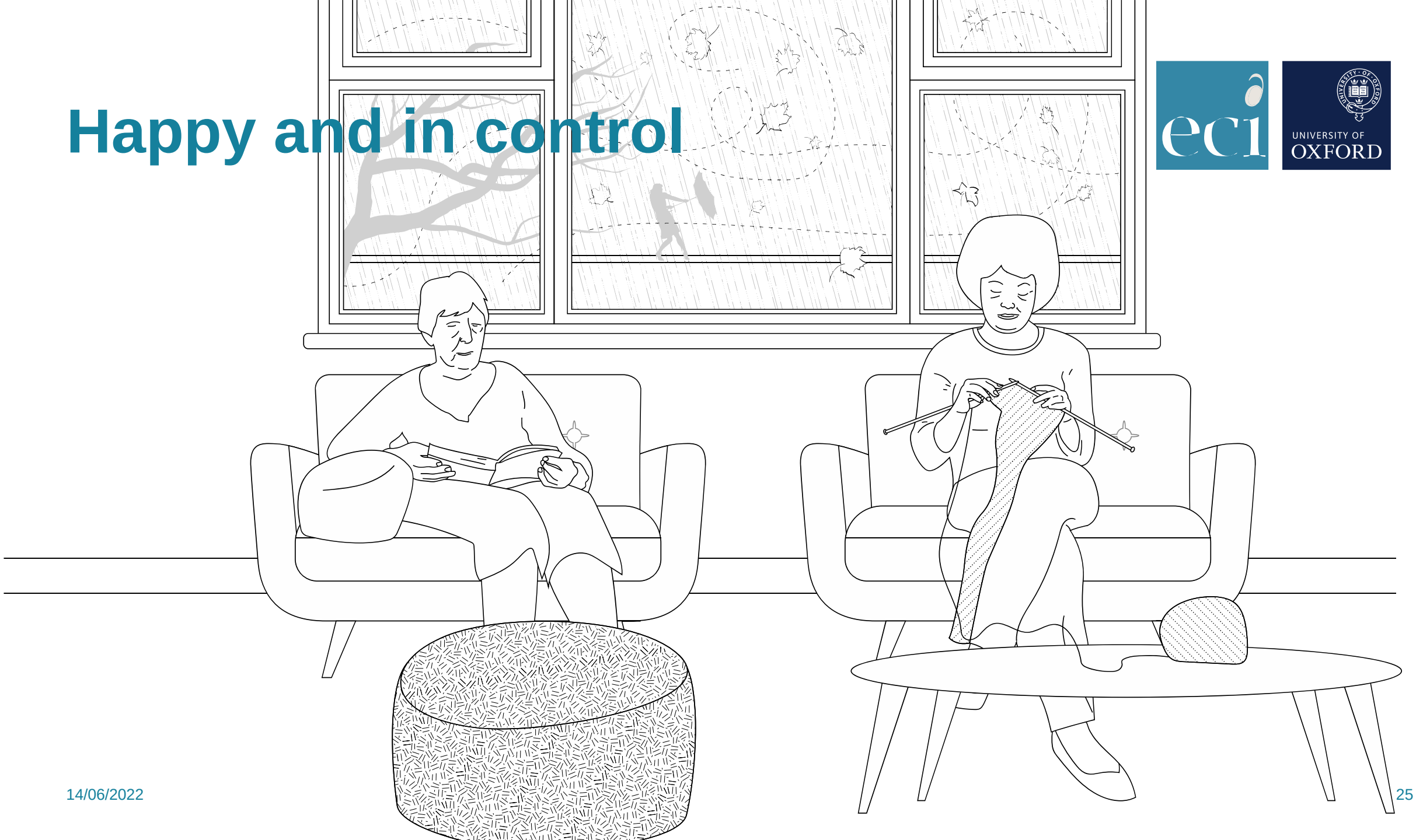
Home

Home is a place of a great significance and meaning for individuals

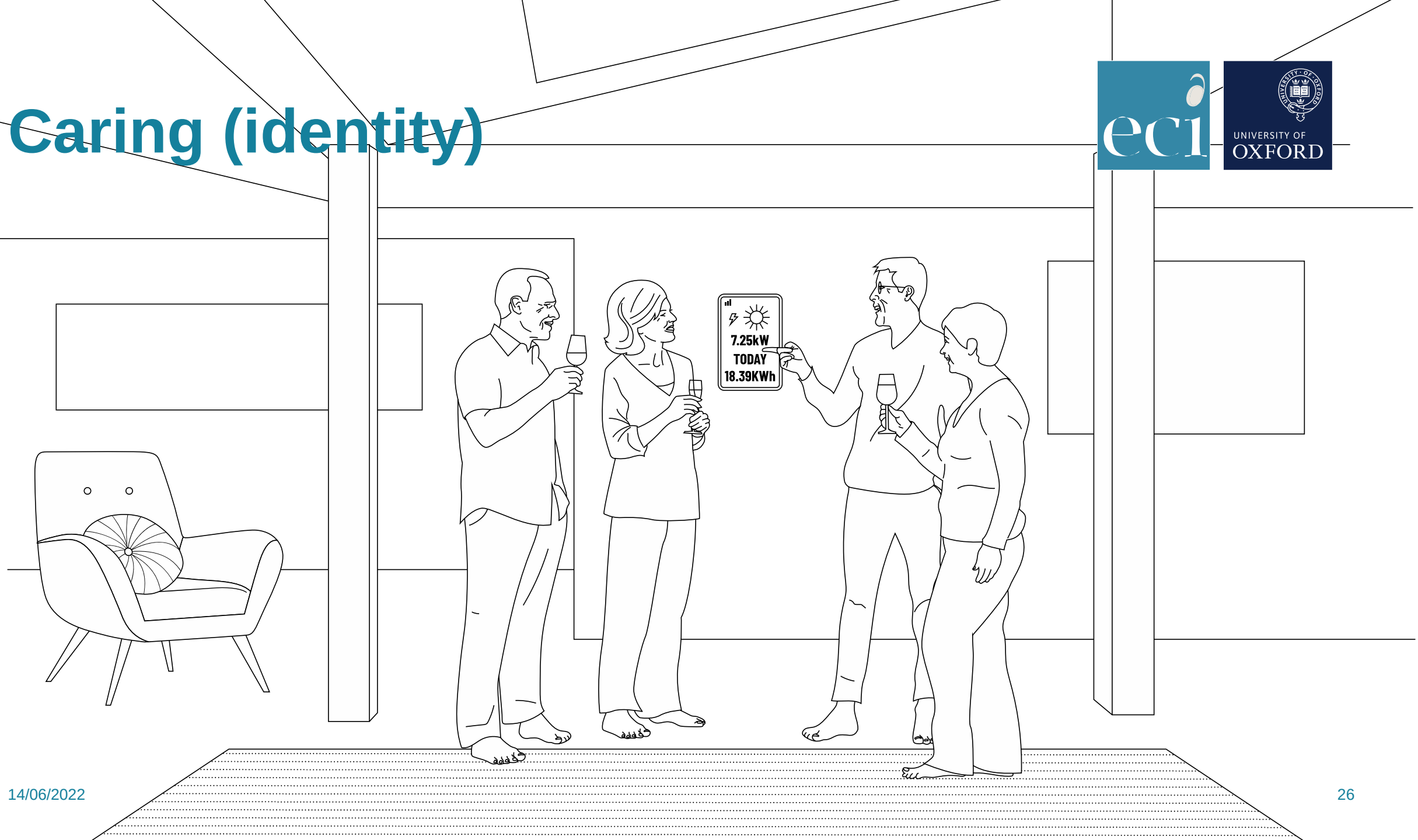
Common frame of reference

Cognitive	**H**ealth and wellbeing	**C**limate concerns	**F**inancial considerations
Home for the Common Future			
Emotional	**H**appy and in control	**C**aring (identity)	**F**uture-resilient

Happy and in control



Caring (identity)



Insights: home-meanings

Generic:

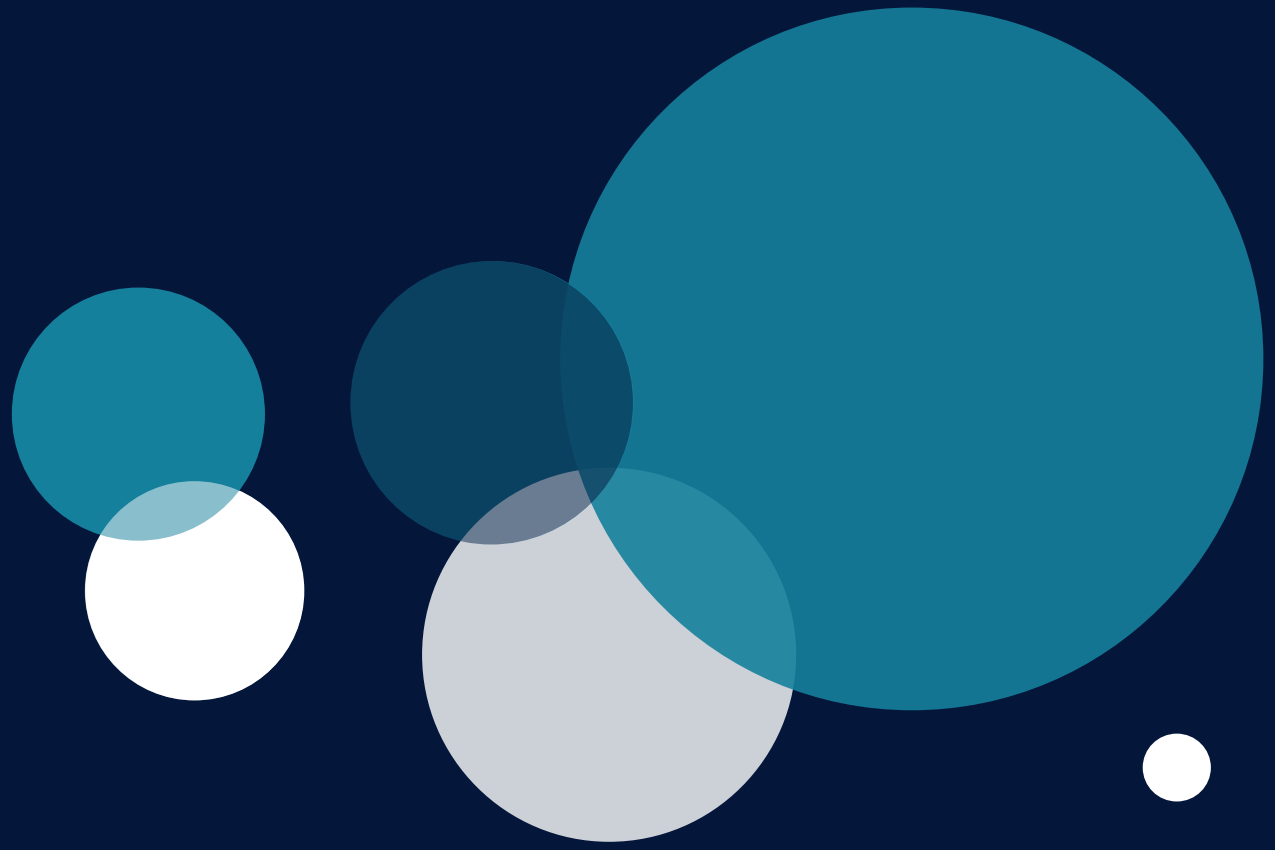
- Use **common frame of reference** to understand the diversity of benefits of low-carbon dwellings
- Use both **cognitive** reasoning and **emotional** triggers

Specific:

- **H**ome for the **C**ommon **F**uture (**HCF**)
- Cognitive and emotional experience:
  - **health and wellbeing; climate concerns, financial considerations**
  - **happy and in control, caring (identity), future-resilient**

Summary

Insights at a glance



Summary of the insights

Areas:

- Retrofit as a process
- Information sources
- Homeowner capacity for retrofit
- Home-meanings

Insights:

- Proximal and ultimate influences
- Expert and non-expert information sources at different stages of the retrofit journey for different levels of retrofit technology: product, design option and technological system
- Time and mechanisms to build homeowner capacity for successful retrofit (positive experience and confidence in the solutions)
- **H**ome for the **C**ommon **F**uture
  - Cognitive: **H**ealth and wellbeing, **C**limate concerns, **F**inancial considerations
  - Emotional: **H**appy and in control, **C**aring (identity), **F**uture-resilient

Thank you for listening

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